



# SR 504 Extension Feasibility Study

## Executive Summary

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### Background

In 1997, the Washington State Department of Transportation (WSDOT) finished reconstruction of the Spirit Lake Memorial Highway (SR 504) connecting the Mount St. Helens National Monument with Interstate 5 to the west. Twenty years after Mount St. Helens erupted, interest in the volcano remains high, especially in the surrounding rural counties where residents want to improve economic development opportunities related to tourism. As a result of the surrounding counties' efforts, the Washington State Legislature provided funds for WSDOT to conduct the *SR 504 Extension Feasibility Study*.

The purpose of this study is to identify the possible routes, environmental concerns, engineering constraints, construction costs, and economic feasibility of extending the Spirit Lake Memorial Highway, SR 504, from the National Monument to state and federal roads on the eastern side of the monument. The study area is bounded by State Route 503 to the south, U.S. Route 12 to the north, Forest Service Road 25, and a north-south traverse connecting the towns of Yale and Mossyrock to the west (Figure 1).

### Purpose and Need

The purpose for connecting SR 504 with a state or federal road to the north, south, or east of the Mount St. Helens National Monument would be to provide a connection that would create a new loop route connecting Mount St. Helens with east and west sides specifically Mount Rainier, the Columbia Gorge, and eastern Washington.

The need for connecting SR 504 with a state or federal road to the north, south, or east of the Mount St. Helens National Monument is the following:

- Improve economic development opportunities
- Improve resident and visitor access
- Provide a shorter emergency medical and law enforcement response route
- Provide a year-round emergency evacuation route

**PROJECT STUDY AREA  
SR 504 EXTENSION  
FEASIBILITY STUDY**

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## Participation

WSDOT was the lead agency for the *SR 504 Extension Feasibility Study*. A Technical Advisory Committee (TAC) was developed, consisting of the U.S. Forest Service (USFS), United States Geological Survey (USGS), Weyerhaeuser, the Southwest Washington Regional Transportation Council (RTC), and the Southwest Washington Regional Transportation Planning Organization (SWRTPO). HDR Engineering, Inc. was retained by WSDOT to conduct the *SR 504 Extension Feasibility Study*. Lewis County led the public involvement effort.

A Public Involvement Committee (PIC) provided review, advice, and comment on key aspects of the feasibility study. The PIC met three times during the project. In addition to the PIC, four public meetings were held to present study results and solicit comments from interested parties.

## Issues, Expectations, and Evaluation Criteria

Project issues and expectations were developed in the first TAC meeting, the first PIC meeting, and the first set of public meetings. These issues and expectations were broken into three primary categories: environmental, economic, and engineering, and assigned corresponding evaluation criteria.

## Existing Conditions

The purpose of documenting existing conditions is to provide a baseline for the application of the environmental, engineering, and economic criteria. The following sections summarize the existing conditions within the study area based on best available information from federal, state, regional, county, and local agencies.

### Natural Resources

The information presented on the following pages provides an overview of the types of resources in the study area. The following natural resources may be affected by the extension of SR 504. Potential effects could include habitat loss or modification resulting in species displacement; aquatic impacts from bridge and culverts; water quality concerns from roadway runoff; or conflicts with current land management. (Note: The information was not verified by field observation and is subject to interpretation.)

#### Aquatic Resources

The Cispus and Toutle rivers lie on the north side of Mount St. Helens and flow from east to west through the study area. The Cispus River enters the

Cowlitz River approximately 7 miles upstream (east) from Riffe Lake. The Mossyrock Dam that impounds the Cowlitz River created Riffe Lake.

The Toutle River originates along the west and northwest side of Mount St. Helens in two tributaries: the North Fork and the South Fork. The North and South Forks of the Toutle River were both altered significantly by mud slides and debris flows associated with the 1980 eruption of Mount St. Helens. The Green River is a major tributary to the North Fork of the Toutle River.

South of Mount St. Helens two tributaries are within the project area: the Lewis River and the Kalama River. These rivers flow from east to west through the study area. The Lewis River follows the southern boundary of the study area. The Kalama River originates on the southwest slope of Mount St. Helens and flows southwesterly approximately 44 miles into the Columbia River.

These rivers support aquatic ecosystems including species protected under the Endangered Species Act such as bull trout and salmonids. Species that are associated with the rivers and riparian area also include reptiles, amphibians, songbirds, insects, mollusks, and resident fish such as trout. Roadways adjacent to or that intersect streams can potentially modify the river characteristics and subsequently affect these species.

### **Water Quality**

Most of the streams and rivers within the study area have not been monitored extensively for water quality, because they are located in areas where there are no monitoring programs. According to the Clean Water Act, human activities shall not affect waterbodies that are, or could be on the 303(d) list for specific pollutants. However, four stream reaches within the study area were on the 303(d) list for temperature. The 303(d) list identifies stream and river segments that may have water quality impairments. These are:

- Green River, Green River Hatchery
- Herrington Creek, near confluence with the South Fork of the Toutle River
- Iron Creek, near confluence with the Cispus River
- Cispus River, downstream of Iron Creek

### **Federal Threatened and Endangered Species**

Within the study area there is the potential for habitat and/or presence of species listed or proposed under the Endangered Species Act (ESA). These species are legally protected under the ESA from “take” or “harm,” including individual loss or modification to behavior. These species were

identified through recovery plans, listing summaries, inventory/status reports, and conversations with agency personnel. Species or habitat that may be within the study area are the spotted owl; Canada lynx; brown bear; gray wolf; bull trout; chinook, chum, coho, and steelhead salmon; water howellia; Bradshaw's lomatium; and Nelson's checkermallow.

### **Wetlands**

Wetlands provide water quality, wildlife habitat, and other environmental functions. They can be hydraulically connected either to water bodies such as rivers and lakes, or isolated areas caused by topographic depressions. Wetlands are also known to support some of the ESA and other sensitive species in the area. Impacts to wetlands are regulated under the Clean Water Act. Several types of wetland systems are found throughout the study area.

### **Vegetation and Priority Habitats**

There are six designated vegetative communities within the study area. Using satellite imagery and information provided by staff, Washington Department of Fish and Wildlife (WDFW) characterized these communities as follows:

- Montane Coniferous wetland
- Westside riparian wetland
- Herbaceous wetland
- Montane mixed Conifer
- Westside oak and dry Douglas-fir
- Westside lowland Conifer-hardwood

WDFW has identified priority habitats within the state that the agency determined deserve special consideration in project development. The priority habitats located within the project area are caves, cliffs, oak woodlands, old-growth mature, prairie, riparian, snags, talus, open space, and wetlands.

### **Cultural Resources**

Two sites adjacent to the study area in Lewis County are listed in the National Register of Historic Places and the Washington Heritage Register. These sites are the Randle Ranger Station - Work Center and the North Fork Guard Station No. 1142, both located in the Gifford Pinchot National Forest (WDCTED, 1999). In addition to their cultural importance, the sites are important as they are protected through federal and state laws.

### **Wild and Scenic Rivers**

In accordance with the Wild and Scenic Rivers Act, designated watercourses must be preserved in free-flowing condition, and their immediate environments protected. There are no federally designated Wild

and Scenic Rivers in the study area. However, the Gifford-Pinchot National Forest (GPNF) Forest Plan recommends the Lewis River, Cispus River, and the Muddy Fork and Clear Fork of the Cowlitz River be considered for designation as Wild and Scenic Rivers. Additionally, eight other rivers in the project area are recommended for further study. There may be design requirements or prohibitions for bridges across, or roadways near, a designated Wild and Scenic River.

### **Land Management**

The study area is located in Lewis, Skamania, and Cowlitz counties. Lewis and Cowlitz counties have adopted land use plans and zoning ordinances that guide land use.

The GPNF comprises the majority of the study area. Its 1990 Forest Plan and subsequent amendments guide land use and management. Within the study area, key management areas include the Mount St. Helens National Volcanic Monument, inventoried late successional reserves, roadless areas, riparian buffer requirements, and the Goat Marsh Research Natural Area. The Mount St. Helens National Volcanic Monument is further managed according to the Comprehensive Management Plan.

Washington Department of Natural Resources is also a major landowner in the area. Private timber and forestry interests, such as Weyerhaeuser, own large portions of the study area outside the GPNF. Riparian management on non-federal lands is directed by the Washington State Forest and Fish Plan. This plan specifies buffer widths based upon stream types and limits timber harvests within these areas.

### **Recreation**

Recreational opportunities in the study area include hiking, camping, fishing, hunting, mountain biking, boating/canoeing, climbing, horseback riding, and nature study, as well as winter recreation activities such as cross-country skiing, snowshoeing, and snowmobiling. Opportunities for more remote recreation are also available in the study area. Existing recreation can either be enhanced with greater access or potentially affected through secondary effects such as noise or visual impacts.

### **Geology**

Throughout the study area geologic formations have been shaped by the historic volcanic activities of Mount St. Helens, such as the Ape Caves. The 1980 eruption and subsequent activity have altered the geology of the area north of the mountain, forming a Pumice Plain. Volcanic activity and other geologic processes continue to occur at Mount St. Helens. These activities primarily affect the area below the crater, Spirit Lake, and the debris avalanche area to Coldwater Lake. Landslide activity is reported to be common in the study area, and landslide deposits occur in many areas.

The geology of the area would significantly affect the design and cost if the roadway were extended.

### **Air Quality**

According to the Southwest Clean Air Agency, air quality in the study area is good and does not exceed the National Ambient Air Quality Standards or the air quality standards promulgated by the state of Washington. New roadways and associated vehicle increases could affect air quality and the state's ability to meet these standards.

### **Noise**

Noise sources associated with human activity in the study area include vehicles on federal, state, local, regional, and private roadways; mechanical equipment used in silviculture; and aircraft. The noises produced from these sources are generally intermittent and contribute to background levels; however, depending on distance from the noise source, noise from these sources could become a dominant feature in noise environment and may be considered a nuisance.

## **Transportation**

### **Traffic Volumes**

Existing traffic volume information in the vicinity of the study area was obtained from WSDOT and the USFS. WSDOT provided average daily traffic (ADT) volume information along U.S. 12, SR 504, and SR 503. The USFS provided ADT volume information at entrances and exits to the Mount St. Helens visitor centers along SR 504, as well as at other locations along national forest roads around Mount St. Helens.

### **Level-of-Service**

Operations along the various roadways were evaluated using Level-of-Service (LOS) measurements that correspond to a letter from A through F. LOS is an industry standard for measuring traffic operations. A rating of "A" is used to indicate relatively free-flowing operations and a rating of "F" indicates severely congested traffic. LOS "E" and "F" are considered unacceptable operating conditions.

## **Analysis of Future Traffic Projections (Year 2020)**

Future traffic volume estimates were developed based on the existing traffic volumes and the population and tourism projections. The analysis assumes a 1.8 percent annual growth rate of existing traffic volumes over a 20-year period (2000 to 2020) to reflect the increase in population and establish the background, or no-build conditions. Tourism-related traffic volumes were added to the population-increased volumes to obtain the future traffic projections for the build scenario. The tourism-related traffic volumes were estimated assuming completion of a road that would

provide a connection to the east side of the mountain. Table 1, below, compares existing and future traffic conditions in select locations.

<i>Table 1. Existing and Future Traffic Conditions</i>				
<i>Intersection</i>	<i>ADT Volume</i>		<i>Level of Service</i>	
<b>U.S. 12 and</b>	<i>Current</i>	<i>Future</i>	<i>Current</i>	<i>Future</i>
East of Southbound I-5 Ramp	6,420	9,170	C	D
East of Northbound I-5 Ramp	9,200	13,160	D	D
East of SR 122	6,020	8,610	D	D
West of SR 122	6,460	9,240	D	D
<b>SR 504 and</b>				
East of Southbound I-5 Ramp	8,300	11,870	D	D
East of Northbound I-5 Ramp	11,810	16,890	D	E
East of Northfork Viewpoint	1,340	2,800	B	C
East of SR 504 Wye at Coldwater Complex	1,240	2,650	C	C
<b>SR 503 (North) and</b>				
Gabriel Road	6,600	9,440	C	D
<p>Note: The ADT volumes and LOS for U.S. 12 and SR 504 intersections assume a north/northeast connection, and the ADT volumes and LOS for SR 503 (north and south) assume a southern connection.</p> <p>Current ADT volumes are from 1995, 1998, or 1999 depending on intersection.</p> <p>Level of Service is based on PM Peak Hour Volumes.</p>				

## Initial Set of Alignment Options

Fourteen option alignments were developed in the first TAC meeting, the first PIC meeting, and the first set of public meetings (Figure 2). The alignments were intended to provide a wide range of connection opportunities to the north, east, and south of SR 504.

## Evaluation Process

Using the evaluation criteria identified during the TAC, PIC, and public meetings, the consultant team analyzed the options. Given the preliminary nature of this investigation, the evaluation process was limited to a determination of whether an option would have (a) minimal impact/highest benefit, (b) moderate impact or benefit, or (c) major impact/least benefit on a resource relative to the other options. Table 2 is a matrix that summarizes the evaluation of the 14 alignment options.

Note that these rankings are based on preliminary data and one-mile wide alignment corridors, and are meant to be indicators of the *relative* impacts



**TOPOGRAPHY  
SR 504 EXTENSION  
FEASIBILITY STUDY**

**See separate page**

**OPTION EVALUATION MATRIX  
SR 504 EXTENSION  
FEASIBILITY STUDY**

**See separate page**

or benefits of the options. They do not represent a definitive impact evaluation of the 14 options.

## **Detailed Evaluation of Two Options**

After the initial evaluation of the 14 alignments, the TAC and PIC identified two alignments, Riffe Lake Option (Option 6) and Windy Ridge Option (Option 12), as corridors that should receive a more detailed review (Figure 3). (Note that this evaluation is also based on preliminary data that were readily available, and does not represent a definitive impact evaluation of the two options.) The evaluation was then refined for these two options using the following assumptions:

- One-half mile corridors
- Design standards and operation and maintenance requirements for mountainous terrain
- Separate analysis for new and existing roads

### **Riffe Lake Option (Option 6)**

Quantifiable values estimated for the Riffe Lake Option are presented in Table 3. Other results are presented below:

- A new road would connect SR 504 to US 12. Currently, there is no major thoroughfare through a parcel that is otherwise bounded by SR 504, US 12, Forest Service Road 25, and SR 505.
- A moderate increase in noise levels may result from additional vehicles on US 12. There is no anticipated increase of noise levels within the monument.
- Air pollution standards would likely not be exceeded.
- This option is located primarily in private ownership and the ability to develop recreational areas is limited.
- Cultural sites listed on the National Register of Historic Places, or Washington State Register would not be affected.
- The view from the roadway would be primarily of a managed forest landscape, however southbound traffic would have some views of Mount St. Helens.
- Construction of the road would not impair the view of Mount St. Helens from visitor centers.
- The road would be located in an area that would likely be affected by a minor or major volcanic events.
- This road would be a seasonal road that would be open May 1 through November 1, the same period that the Johnston Ridge Visitor center is open.

**OPTION ALIGNMENT  
SR 504 EXTENSION  
FEASIBILITY STUDY**

**See separate page**

# SR 504 Extension Feasibility Study

**Table 3**

## **Evaluation of Riffe Lake Option (Option 6) - Coldwater Ridge Visitor Center to US 12 @ Glenoma via Old FS Road 27**

<b>Screening Criteria</b>	<b>New Road</b>	<b>Existing Road</b>
<b>Environmental Criteria</b>		
Terrestrial Wildlife Resources and Habitat		
Westside Lowland Conifer Hardwood	3,600 acres	1,700 acres
Montane Mixed Conifer Forest	1,400 acres	0 acres
Montane Coniferous Wetlands (Riparian Areas)	100 acres	200 acres
Priority Deer Habitat	2000 acres	700 acres
Priority Elk Habitat	5,000 acres	2,000 acres
Terrestrial Threatened & Endangered Species <sup>1/</sup>		
Potential Lynx Habitat	0 acres	0 acres
Potential Wolf Habitat	0 acres	100 acres
Potential Grizzly Bear Habitat	0 acres	0 acres
Spotted Owl Habitat	0 acres	0 acres
Aquatic Threatened and Endangered Species (streams with historic salmonid presence)	3 crossings	0 crossings
Stream Alteration and Riparian Encroachment	7 crossings	3 crossings
Wetlands	200 acres	200 acres
Late Successional Reserves	0 acres	0 acres
GPNF Roadless Areas	0 acres	0 acres
Riparian Management under Forest and Fish Plan	100 acres	0 acres
<b>Engineering Criteria</b>		
Length of Alignment	17 miles	5 miles
Capital Cost	35 million	9 million
Operation & Maintenance Costs (Annual)	950,000 dollars	
Travel Time to Randle	47 minutes	
Travel Time to Cougar	159 minutes	
Number of Bridges	7	3
Right-of-Way		
USFS: Monument	0 miles	0 miles
USFS : Non-Monument	0 miles	0 miles
WDNR	1 miles	0 miles
Private	16 miles	5 miles
Topographic Indicators		
Number of Grades over 10%	4	0
Number of Passes	1	0

1/ - No habitat data for T&E species were available for state and private lands.

## **Windy Ridge Option (Option 12)**

Quantifiable values estimated for the Windy Ridge Option are presented in Table 4. Other results are highlighted below:

- A new road would connect SR 504 and FS Road 99 through the Pumice Plain. As a result, wildlife would have to cross a paved road to migrate from north to south around the mountain. Wildlife currently migrate through the Pumice Plain, although movement is likely limited due to the lack of vegetative cover.
- A minor increase in noise levels may result from additional vehicles on FS Road 25 and at Iron Creek Campground. Noise levels may also increase throughout the monument area.
- Air pollution standards would likely not be exceeded.
- This option may be able to provide additional recreation access to the north face of mountain and west side of Spirit Lake.
- Cultural sites listed on the National Register of Historic Places, or Washington State Register would not be affected.
- A portion of the roadway would be within the sightline from Coldwater Creek Visitor Center and Johnston Ridge Observatory.
- The roadway would impact on-going scientific research that is being conducted within the National Volcanic Monument boundaries.
- The roadway would be located within the area that has been intermittently affected by volcanic activity, floods, and debris flows since 1980 eruption.
- This road would be a seasonal road that would be open May 1 through November 1, the same period that the Johnston Ridge Visitor center is open.

## **Economic Effects**

An economic analysis was conducted for the SR 504 Extension Feasibility Study to estimate the potential economic effects of the Riffe Lake and Windy Ridge Option alignments. Economic effects fall into two basic categories: economic impact effects and economic efficiency effects. The economic impact analysis focuses primarily on the effects on regional and local economies. It should be noted that the economic impact analysis is based on secondary sources of economic data and an intercept survey is recommended if a next stage of study is pursued for the SR 504 extension. Economic efficiency effects address the magnitude of costs compared to the magnitude of benefits, without regard to the distribution of the benefits and costs. This type of analysis is frequently referred to as benefit-cost analysis. A central focus of economic efficiency analysis is the calculation

# SR 504 Extension Feasibility Study

Table 4

## Evaluation of Windy Ridge Option (Option 12) -Coldwater Ridge to Windy Ridge to FR 25@Wakepish via FS Road 99

Screening Criteria	New Road	Existing Road
<b>Environmental Criteria</b>		
Terrestrial Wildlife Resources and Habitat		
Westside Lowland Conifer Hardwood	700 acres	800 acres
Montane Mixed Conifer Forest	1,700 acres	4,400 acres
Montane Coniferous Wetlands	0 acres	0 acres
Priority Deer Habitat	0 acres	0 acres
Priority Elk Habitat	2,000 acres	5, 000 acres
Terrestrial Threatened & Endangered Species <sup>1/</sup>		
Potential Lynx Habitat	0 acres	0 acres
Potential Wolf Habitat	700 acres	0 acres
Potential Grizzly Bear Habitat	0 acres	100 acres
Spotted Owl Habitat	0 acres	1,300 acres
Aquatic Threatened and Endangered Species (streams with historic salmonid presence)	1 crossing	0 crossings
Stream Alteration and Riparian Encroachment	3 crossings <sup>2/</sup>	6 crossings
Wetlands Impacts	100 acres	0 acres
Late Successional Reserves	0 acres	600 acres
GPNF Roadless Areas	0 acres	0 acres
Riparian Management under Forest and Fish Plan	0 acres	0 acres
<b>Engineering Criteria</b>		
Length of Alignment	7 miles	15 miles
Capital Cost	18.5 million	22.5 million
Operation & Maintenance Costs (Annual)	1,225,000 dollars	
Travel Time to Randle	81 minutes	
Travel Time to Cougar	116 minutes	
Number of Bridges	5	7
Right-of-Way		
USFS: Monument	7 miles	0 miles
USFS : Non-Monument	0 miles	15 miles
WDNR	0 miles	0 miles
Private	0 miles	0 miles
Topographic Indicators		
Number of Grades over 10%	1	0
Number of Passes	1	0

1/ - No habitat data for T&E species were available for state and private lands.

2/ - Because of the unstable nature of the pumice plain, there continues to be lateral migration of the North Fork of the Toutle River and its' associated tributaries. Therefore, the number of stream crossings is difficult to quantify based on the half mile corridor used for this analysis.

of Net Present Value (NPV). A positive NPV indicates that the benefits exceed costs and the project may warrant additional consideration. Analysis of highways has typically focused on user benefits. However, there are other costs and benefits involved beyond user benefits and construction and operating costs, as a variety of other resources are affected and the associated opportunity costs may be of considerable importance.

Four specific needs are set forth that would be addressed by connecting SR 504 with a state or federal road to the north or east of the Mount St. Helens National Monument. One need is to improve economic development opportunities in areas surrounding the monument. The potential for increased tourism impacts in the five area counties was assessed under a range of assumptions. At the low range of assumptions, very small impacts were projected in terms of jobs (1 to 2 jobs for each county). At the high range of assumptions, larger impacts were projected in terms of jobs (55 to 71 jobs for each county). However, even at the high range of assumptions, the number of jobs supported by increased tourism is modest in terms of the total employment existing currently in each county. To generate the 55 to 71 jobs for each county, the businesses in each county would have to attract one visitor in five to the county.

A second need is to improve resident and visitor access to the area surrounding the monument. The potential for meeting this need in an economically efficient manner was assessed in a benefit cost analysis, comparing the capital costs for building the road and the annual O&M costs with the benefits to users measured in terms of changes in travel times and the opportunity cost of the potential savings in time. The Riffe Lake option to Randle provides annual benefits with the high traffic assumption of \$7.4 million and a NPV of \$57 million, and with the low traffic assumption of \$4.3 million and a NPV of \$6 million. The Riffe Lake option to Cougar, under the high traffic assumption, provides annual benefits of \$4 million and a NPV of \$5 million. For all other combinations (the Riffe Lake option under low traffic assumption to Cougar, and the Windy Ridge option under both high and low traffic assumptions, for both destinations) the NPV is negative. Although there is travel timesavings, and thus benefit, for the Windy Ridge option, it is far too small to offset the cost of the option.

Other benefits and costs related to the additional access were not evaluated in this analysis. Other needs, such as providing improved access to specific attractions or sites, may provide additional benefits and costs. Given the preliminary nature of this investigation, such issues must remain unexamined; however, the fact that they have not been addressed at this point is not an indication that they may be unimportant.



## Funding Strategies

A funding strategies study was conducted which evaluated funding strategies for the development and operation of the SR 504 extension. The financial and other characteristics of the Riffe Lake and the Windy Ridge Options are evaluated, and the ability of the project to be funded from conventional and novel sources is discussed.

The study concluded that the project will have difficulty proceeding under existing state or federal funding avenues alone because of the intense competition for, and limitations of, such funding. State funding of an extension is not likely and the extension of SR 504 is not currently part of the Washington State Highway System Plan. Financial commitment from the public sector in the study area will be required to achieve a sound funding strategy.

The study first sets out the criteria for a sound funding strategy, and evaluates both new pricing options (i.e., new taxes or tolls) and various ways to channel new and existing funds to the project. The funding strategies study reviewed available pricing/taxing tools, including tolls, shadow tolls, property, fuel and sales tax increments, system development charges, and value capture methods. Local, state and federal funding options were reviewed, as were public and private bonding facilities. These include federal discretionary and scenic lands programs, and novel credit enhancement strategies to leverage scarce funds.

Fundamentally, the difficulty in developing a funding strategy for SR 504 was not that there is a scarcity of funding resources and instruments; rather, the project's costs are large relative to its transportation benefits, and its economic development benefits are difficult to quantify. This makes underwriting the necessary financing more difficult.

The funding strategies study concluded that there were four basic alternative funding strategies:

1. Seek high priority or discretionary project funding from federal highway authorities. While the likelihood that such funding can be secured is low, this is the most desirable way to fund the project from a local perspective. Likelihood for funding is low, because the project costs are large relative to the transportation benefits, and the economic development benefits are difficult to quantify.
2. Form a special district and develop tax increment and toll revenues from within the district. This strategy can be made to work even in the absence of outside subsidies if local governments are willing to pursue it.

3. Invite the private sector to develop and operate the facility using toll finance augmented by other sources. This strategy could work if a willing private entity could be found. Careful analysis and balancing of risks and return will be required to entice a private entity without excessive public subsidy.
4. Incorporate the project in an integrated transportation and economic development plan, to tap additional private resources. Private economic development that would benefit from the project would have to be identified and persuaded to develop. Such development almost certainly would have to leverage the unique scenic or geologic features of the area for private profit. Although, by doing this there is the risk of detracting from the character of the area in ways that are unacceptable to the general public. A private entity with unique preferences for the location and its amenities would have to be identified.